

Translation

PATENT COOPERATION TREATY

PCT/RU2003/000440



PCT

INTERNATIONAL PRELIMINARY EXAMINATION REPORT

(PCT Article 36 and Rule 70)

Applicant's or agent's file reference	FOR FURTHER ACTION See Notification of Transmittal of International Preliminary Examination Report (Form PCT/IPEA/416)	
International application No. PCT/RU2003/000440	International filing date (day/month/year) 16 October 2003 (16.10.2003)	Priority date (day/month/year) 23 October 2002 (23.10.2002)
International Patent Classification (IPC) or national classification and IPC C10M 159/18		
Applicant INSTITUT NEFTEKHIMICHESKOGO SINTEZA RAN IM. A. V. TOPCHIEVA (INKhS RAN)		

1. This international preliminary examination report has been prepared by this International Preliminary Examining Authority and is transmitted to the applicant according to Article 36.
2. This REPORT consists of a total of <u>4</u> sheets, including this cover sheet. <input type="checkbox"/> This report is also accompanied by ANNEXES, i.e., sheets of the description, claims and/or drawings which have been amended and are the basis for this report and/or sheets containing rectifications made before this Authority (see Rule 70.16 and Section 607 of the Administrative Instructions under the PCT). These annexes consist of a total of _____ sheets.
3. This report contains indications relating to the following items: I <input checked="" type="checkbox"/> Basis of the report II <input type="checkbox"/> Priority III <input type="checkbox"/> Non-establishment of opinion with regard to novelty, inventive step and industrial applicability IV <input type="checkbox"/> Lack of unity of invention V <input checked="" type="checkbox"/> Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement VI <input type="checkbox"/> Certain documents cited VII <input checked="" type="checkbox"/> Certain defects in the international application VIII <input type="checkbox"/> Certain observations on the international application

Date of submission of the demand 18 May 2004 (18.05.2004)	Date of completion of this report 16 November 2004 (16.11.2004)
Name and mailing address of the IPEA/RU	Authorized officer
Facsimile No.	Telephone No.

INTERNATIONAL PRELIMINARY EXAMINATION REPORT

International application No.

PCT/RU2003/000440

I. Basis of the report

1. With regard to the elements of the international application:*

- ☒ the international application as originally filed
- ☐ the description:
 pages _____, as originally filed
 pages _____, filed with the demand
 pages _____, filed with the letter of _____
- ☐ the claims:
 pages _____, as originally filed
 pages _____, as amended (together with any statement under Article 19
 pages _____, filed with the demand
 pages _____, filed with the letter of _____
- ☐ the drawings:
 pages _____, as originally filed
 pages _____, filed with the demand
 pages _____, filed with the letter of _____
- ☐ the sequence listing part of the description:
 pages _____, as originally filed
 pages _____, filed with the demand
 pages _____, filed with the letter of _____

2. With regard to the language, all the elements marked above were available or furnished to this Authority in the language in which the international application was filed, unless otherwise indicated under this item. These elements were available or furnished to this Authority in the following language _____ which is:

- ☐ the language of a translation furnished for the purposes of international search (under Rule 23.1(b)).
- ☐ the language of publication of the international application (under Rule 48.3(b)).
- ☐ the language of the translation furnished for the purposes of international preliminary examination (under Rule 55.2 and/or 55.3).

3. With regard to any nucleotide and/or amino acid sequence disclosed in the international application, the international preliminary examination was carried out on the basis of the sequence listing:

- ☐ contained in the international application in written form.
- ☐ filed together with the international application in computer readable form.
- ☐ furnished subsequently to this Authority in written form.
- ☐ furnished subsequently to this Authority in computer readable form.
- ☐ The statement that the subsequently furnished written sequence listing does not go beyond the disclosure in the international application as filed has been furnished.
- ☐ The statement that the information recorded in computer readable form is identical to the written sequence listing has been furnished.

4. ☐ The amendments have resulted in the cancellation of:

- ☐ the description, pages _____
- ☐ the claims, Nos. _____
- ☐ the drawings, sheets/fig _____

5. ☐ This report has been established as if (some of) the amendments had not been made, since they have been considered to go beyond the disclosure as filed, as indicated in the Supplemental Box (Rule 70.2(c)).**

* Replacement sheets which have been furnished to the receiving Office in response to an invitation under Article 14 are referred to in this report as "originally filed" and are not annexed to this report since they do not contain amendments (Rule 70.16 and 70.17).

** Any replacement sheet containing such amendments must be referred to under item 1 and annexed to this report.

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V. Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement

1. Statement

Novelty (N)	Claims	1 - 4	YES
	Claims		NO
Inventive step (IS)	Claims	1 - 4	YES
	Claims		NO
Industrial applicability (IA)	Claims	1 - 4	YES
	Claims		NO

2. Citations and explanations

D1: WP 2001/094504 A2

The method described in D1 is the closest prior art.

D1 describes a method for producing an additive to lubricating materials in the form of nano-size surface-modified particles of molybdenum trisulphide by forming a microemulsion of an oil-soluble surfactant substance in an organic solvent and an aqueous solution of a water-soluble inorganic compound of hexavalent molybdenum; and by adding the surfactant substance (selected from the same class of compounds as in the claimed method) for modifying the molybdenum trisulphide with subsequent removal of the water from the microemulsion, separation of the molybdenum trisulphide in the form of surface-modified particles, extraction by means of a suitable solvent and removal of the latter.

The method according to claim 1 differs from the method described in D1 in that a mixture, homogenised in a polar solvent, of thiomolybdenum acid salt with one of the modifiers indicated in claim 1 is subjected to heat treatment, followed by cooling of the mixture and addition of another modifier. Moreover, the claimed method excludes the use of aqueous solutions and diluted organic solutions, thereby simplifying the process of producing the additive.

The method according to claim 2 differs from the method described in D1 in that inorganic sulphide or polysulphide or thiouric acid is used instead of hydrogen sulphide, and in that the mixture of molybdenum acid salt and sulphide with one of the modifiers characterised in claim 2, homogenised in a polar solvent, is subjected to heat treatment, followed by cooling of the mixture and addition of another modifier.

The claimed method excludes the use of aqueous solutions, diluted organic solutions and hydrogen sulphide, thereby simplifying the additive production process.

It is not obvious to a person skilled in that art that heating the mixture and excluding the use of aqueous solutions will produce an additive with a monodispersed distribution according to particle size.

Therefore claims 1-4 meet the requirements of novelty, inventive step and industrial applicability.

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Supplemental Box

(To be used when the space in any of the preceding boxes is not sufficient)

Continuation of: VII

1. In describing the method, when describing the heat treatment stage, claim 2 does not mention inorganic sulphide. Furthermore, the alternative concerning "the use of a mixture of the first and second modifiers and subsequent addition of the mixture of the first and second modifier", as stated in claim 2, is not based on the description, and is meaningless.

2. A mistake has been made in describing example 12: if it is performed in accordance with example 1, the latter uses propanol, and not methanol.

3. The description of examples 21 and 22 does not correspond to the set of claims and table 1, as it does not mention a second modifier.

4. The molybdenum content mentioned for examples 1 and 22 in the table on page 9 does not coincide with the values stated in examples 1 and 22.